Amendments to the Claims

The listing of claims will replace all prior versions, and listings of claims in the application.

1. (Currently Amended) A modulation method for multiple-tone signalling using a system with an analogue front end, comprising the steps of:

feeding a symbol data stream of multiple tone symbols to a model and to a buffer for onward transmission to the analogue front end;

in the model, modelling the peak amplitude that will be present in the symbol data stream after subsequent processing by the analogue front end;

feeding forward a control signal based on the modelled peak amplitude from the model to the analogue front end; and

outputting the symbol data stream from the buffer through the analogue front end under the control of the control signal so as to avoid passing, along with the symbol data stream, separate information required by a receiver to demodulate the symbol data stream.

2. (Original) A method according to claim 1 wherein the analogue front end includes an amplifier operable from a plurality of different voltage levels, and wherein the control signal selects one of the plurality of different voltage levels in the amplifier.

3. (Original) A method according to claim 1 including preprocessing the symbol data stream in the analogue front end, and modelling the preprocessing in the model.

4. (Original) A method according to claim 3 wherein the modelling is carried out separately on each symbol.

5. (Original) A method according to claim 4 further comprising processing an input data stream through a plurality of intermediate processing stages and corresponding stages of intermediate data to generate the symbol data stream; and

if the modelled peak amplitude in a particular symbol in the symbol data stream exceeds a predetermined threshold, amending predetermined intermediate data such that the input data is still represented by the intermediate data, carrying out the subsequent intermediate processing stages on the intermediate data to regenerate the particular symbol in the symbol data stream, and replacing the particular symbol with the regenerated symbol.

6. (Currently Amended) A multiple tone modem comprising:

a modulator for generating a symbol data stream of multiple tone symbols;

an analogue front end for processing the symbol data stream, the analogue front end including a digital to analogue converter and a line driver for driving a line; and

a model for processing the symbol data stream to predict the amplitude peaks present in the symbol data stream after subsequent processing by the analogue front end and for feeding forward a control signal based on the modelled amplitude peaks to the analogue front end;

wherein the analogue front end includes a control input for accepting the control signal and the analogue front end processes the symbol data stream under the control of the control signal so as to avoid passing, along with the symbol data stream, separate information required by a receiver to demodulate the symbol data stream.

7. (Original) A multiple tone modem according to claim 6 wherein the analogue front end includes a line driver connected to a plurality of different power supply voltage levels and the control signal selects one of the power supply voltage levels based on the amplitude peaks in the symbol data stream.

8. (Original) A multiple tone modem according to claim 6 further comprising a data buffer between the modulator and the analogue front end.

9. (Original) A multiple tone modem according to claim 6 wherein the analogue front end further comprises a preprocessing module for preprocessing the symbol data stream, and wherein the model models the preprocessing.

10. (Original) A multiple tone modem according to claim 8 wherein the model models the peak amplitude separately for each symbol in the symbol data stream.

11. (Original) A multiple tone modem according to claim 10 wherein:

the modulator includes a plurality of intermediate processing stages for processing an input data stream through a plurality of stages of intermediate data and generating the symbol data stream; and

the modulator further comprises a regeneration control system actuated if the modelled peak amplitude in a symbol exceeds a predetermined threshold to amend predetermined intermediate data such that the input data is still represented by the intermediate data, and to carry out the subsequent intermediate processing stages on the amended intermediate date to regenerate a replacement symbol.

Claims 12-13. (Cancelled)

14. (Currently Amended) A multiple tone transmission system comprising:

a transmitter including a modulator for generating a symbol data stream of multiple tone symbols,

an analogue front end for processing the symbol data stream, the analogue front end including a digital to analogue converter and a line driver for driving a line; and

a model for processing the symbol data stream to predict the amplitude peaks present in the symbol data stream after subsequent processing by the analogue front end and for feeding forward a control signal based on the modelled amplitude peaks to the analogue front end; and

wherein the analogue front end includes a control input for accepting the control signal and the analogue front end processes the symbol data stream under the control of the control signal so as to avoid passing, along with the symbol data stream, separate information required by a receiver to demodulate the symbol data stream;

further comprising a transmission line; and

a receiver connected to the transmission line to decode the transmitted data stream.